did not form a compact bundle. At the same time the residua of even a compact bundle may disappear in the cases where resorption is very active, as in young animals, for example. *c.* If a compact bundle can be traced in a tract for some distance and then disappears, the possibility that the fibres may run for a time isolated and then intermingle with the others forming the nerve, must always be admitted.

Reviewing the literature in the light of the general conclusions thus given, the author proceeds to examine the evidence for the position of the crossed and uncrossed optic fibres both in the tract and in the nerve. The evidence is not decisive. In the optic nerve the uncrossed fibres form a more or less closed bundle; but whether its usual position is laterad, as indicated by the majority of the cases, or whether it is more often variable, is uncertain. In the tract the majority of authors report a more or less isolated condition of the uncrossed bundle and a lateral position. It is to be borne in mind, however, that just these cases were most liable to be reported, since in them the results of the lesion were most clear and definite. This entire paper is an unusually valuable contribution to this subject, and it may be noted in passing, that it was offered as a dissertation for the degree of M. D. at Leipzig.

Ueber die Folgen der Durchschneidung des Hirnbalkens. ALEXANDER V. KORÁNYI. Arch. f. d. ges. Physiologie des Menschen u. der Thiere. B. XLVII. H. 2 u. 3. Feb., 1890.

The work was done in the laboratory of Prof. Goltz at Strassburg. The author concludes that section of the callosum (in dogs) causes no marked disturbance, unless the hemispheres are at the same time injured. In case of such injury there may appear disturbances of vision, of tactual sensations and of motion, and that, too, when the injury of the white matter is to a portion far removed from that to which the respective functions are attributed. The disturbances, however, are transitory. Further, after section of the callosum, convulsions of the entire body may appear. There is wanting in this account the descriptions of the lesions, and the statement as to the number of experiments and the length of time that the animals survived the operation in each case, all of which data are necessary for the proper valuation of the results.

Further note on degenerations following lesions of the cerebral cortex. C. S. SHERRINGTON. The Journ. of Physiology. Vol. XI, Nos. 4 and 5.

When the pyramidal tract degenerates as a result of injury to the cerebral cortex, degenerated fibres are found in the following portions of gray matter, 1. Ventral gray *cornua* of spinal cord. 2. Lateral gray *cornua* of spinal cord. 3. Isolated gray masses in the *pons*, lying among the deep transverse fibres of the *pons*, (*stratum complexum pontis*) and close to the fibre bundles of the *crusta*. 4. A mass of gray matter lying in the mesal third of the crustal portion of the *crus cerebri*, (a well-defined mass in the monkey). 5. The *substantia nigra*, more especially the ventral portion of it. Interest attaches to these fibres, which are always of small size, because they are considered to be in connection on the one hand with the gray matter and on the other with the pyramidal fibres. In the spinal cord a degeneration of the fibres in the column of Clark has not been found associated with pyramidal degeneration. In cases of cortical lesion confined to the "leg area" a considerable number of fibres in the *substantia nigra* are found degenerated. To what animals these results apply is not stated.

Einiges über das Gehirn der Edentata. H. RABL-RÜCKHARD. Archiv f. Mikros. Anat. B. XXXV, H. 2. Mai. 1890. 1 pl.

From the examinations of cross-sections of the brain from a fully developed fœtal armadillo, (*Xenurus gyrunurus*), the author identifies a

bundle of fibres each side of the middle line, and connected with the *commissura anterior*, with the *pars frontalis commissuræ anterioris* as described by Osborn for the kangaroo, by Flower and Sander for some other marsupials, by Ganser for the mole, and by Hamilton for the human brain. A second portion of the paper deals with the conformation of that portion of the Sylvian aqueduct which may be considered the homologue of the *torus longitudinalis* in the bony fishes.

Ueber den feineren Bau des Vorderhirns der Amphibien. A. OYARZUN. Archiv f. Mikros. Anatomie. B. XXXV, H. 3. Juni, 1890.

The author worked under the direction of Edinger and studied the forebrain in some amphibia (frog, triton and salamander). It has been the current view that undoubted ganglion cells could not be demonstrated in the mantel of the forebrain in vertebrates lower than the reptiles, and hence the homologue of the cerebral cortex of the mammals was considered to be first recognizable in this group. By using a modification of Golgi's method, Oyarzun has been able to demonstrate connective tissue cells and ganglion cells also in the mantel of these amphibia and show that the direction of the axis-cylinder processes from the ganglion cells is that which might be expected. The entire arrangement of the mantel is highly embryonic even in the adult frog, and this gives additional ground for considering the mantel in this case as but slightly differentiated.

II.—EXPERIMENTAL.

Les lois de la fatigue étudiées dans les muscles de l'homme. par ARNALDO MAGGIORA. Travaux de Lab. de Physiol. de Turin, 1889, p. 213. Also, Arch. f. Anat. u. Phys. (Phys. Abth.), H. 3-4, 1890, p. 191.

This is an experimental study, on the muscles of man, of the influences which favor and hinder muscular work. The experiments were made on the flexor muscles of the middle finger. The movements of the finger were recorded by the method described by Prof. A. Mosso in a paper having the same title as this and published in *Travaux de Lab. de Physiol. de Turin*, 1889,—p. 150, also *Archiv. Ital. de Biol.* XIII. p. 123, in a paper read before the Internat. Cong. of Physiol. at Basel, Sept. 1889, and in the *Archiv f. Anat. u. Physiol.* 1890, p. 89.

In the experiments of the author the muscles were stimulated voluntarily or by an induction current applied directly to them or their nerves. The contractions were always maximal, occurred at regular intervals and raised a weight of known amount, the weight being supported during the intervals. The contractions were continued until the power to raise the weight was lost. The record gave the height to which the weight was lifted by each contraction and thus the total amount of work done was readily computed. The amount of work possible was found to vary with the weight and the intervals of rest between the succeeding contractions.

With small weights the work can be continued a very long time even when the contractions succeed each other rapidly. With larger weights, one or more kilos, there is a certain weight for each individual with which, at a given rhythm, he can do the most work before the fatigue becomes complete. The curve of fatigue may be a straight line with a certain weight and a certain rhythm. If the rest between the succeeding contractions be ten seconds no fatigue is seen. The interval is sufficient for the restoration processes to be complete. This recalls the life long work of the heart. An interval of rest sufficient to prevent fatigue by a medium weight is insufficient with a larger weight. It is